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PROJECT RAND

RESEARCH MEMORANDUM

OBJECTIVES OF THE UNITED STATES MILITARY POSTURE

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SUMMARY

In a period in which parity is possible between the Soviet Union and the United States in the possession of large numbers of hardened missiles, what should be the objectives of U.S. military posture -- for general war and for limited war?

OBJECTIVES FOR GENERAL WAR

1. We may ask, with regard to the objective of deterring general war, would our possession of large numbers of hardened missiles in itself assure a stable deterrent? Would it in fact be redundant, guarantee "overkill"? Is deterrence relatively easy to come by in the sense (a) that we need aim at city targets only and guarantee only small damage to them (say, 10 million Russian dead) and (b) that, for the purpose, we need only a small number of delivery vehicles, particularly if they are mobile?

2. If we can deter a well-planned all-out surprise attack with high confidence, does this mean that general war is so unlikely that we need not prepare to fight a general war if deterrence fails? Counterforce missions and active and passive defenses to limit damage to our population and economy are designed to help conclude war on the most favorable terms to the United States. They are key elements in a posture designed to fight a general war. Are they necessary or, for that matter, feasible?

3. What are the implications of the above questions for our choice of targets and for war planning? Should we target cities or military forces?

4. What are the implications of these questions for allocation of our effort in the general war area?

5. What are the implications for the size of our strategic effort?

The answers to the first three questions concerning the objectives of our posture for general war will be developed in the course of a critique of the "Minimum" or "Finite" Deterrence theory, which is now very widely held and influential.

In brief, the answers we will suggest as to the requirements of the U.S. military posture in general war are as follows:

1. On the deterrence objective.

Hardened missiles, even in large numbers, will not, in themselves, guarantee enough destruction in retaliation to form an objective basis for deterring deliberate attack by the Soviet Union under plausible circumstances that may arise in the 1960's. Nor will simply keeping a smaller number of missiles in motion. Under some circumstances the Russians may feel that the alternative of waiting and not striking would risk much more extensive damage than 10 million Russian dead -- to choose the standard mentioned above. But in any case the requirements for retaliation are more complex than has been widely understood. It will require the ability to maintain under conditions of attack a functioning system of elements, including besides the mobile or hardened delivery vehicles with the capacity to reach and penetrate the active and passive enemy defenses, the preservation of centers of responsible decision and control, and a network permitting a protected flow of information to and from these decision centers. The Air Force, which pioneered the weapons systems idea, needs to emphasize a still broader systems concept. With the widespread multiplication and dispersal of weapons, positive signals are essential to avoid war by accident or miscalculation. To deter a deliberate attack, the system of control must

be able to survive the attack which we aim to deter.

2. On the ability to fight a general war.

Even if, at a given state of the art, we are able to deter deliberate attack with high confidence, we will still need the ability to fight a war, among other reasons because changes in weapons technology may remove our deterrent and, in any case, because war may occur by miscalculation. What is more, a capability to fight a general war is feasible -- not in the sense that it could guarantee our coming out unscathed, but in the sense that it could make a significant difference in how we would come out -- in the size of the disaster to our population and economy, and in the terms on which we could force the conclusion of the war. But here again there is a need for a broadened systems concept emphasizing the ability to keep a network of elements alive and in communication for the duration of the enemy's and our own attacks -- for days, not hours or minutes.

3. Targets and plans for general war.

The need both to deter a general war and to fight it if deterrence fails means that no simple choice in war plans is possible between "city-busting" and counterforce objectives. We need broadly different alternative plans adapted to grossly different circumstances of the outbreak of war and of the course it runs. And we need the possibility of making our choice effective in the actual circumstance.

4. Allocation of effort in the general war area.

It follows from this analysis that, both for deterring and fighting a general war, relatively more emphasis must be placed on what are usually considered the supporting parts of the system rather than on the vehicles

themselves -- on the basing and protection of the vehicle by mobility or hardening or concealment or dispersal and, in particular, on the problem of preserving for the duration the flow of information to and from centers of decision. For the counterforce mission, we need a bolder effort to obtain intelligence before the outbreak about the number and location of enemy forces, including a greatly increased reconnaissance effort.

In both the early and late 1960's we will have to spend a lot more money for communications, command, and control than we do now. Our soft, fixed control centers will need replacement by mixtures of extremely hard and mobile centers; our soft land-lines and radio at frequencies subject to blackout need replacing by mixtures of hardened land-lines and line-of-sight radio back-ups, both airborne and in space, using radio frequencies that cannot be blacked out. At the same time, to reduce the chance of accident, control over the increasing number of increasingly dispersed weapons should be made more effective and subject to responsible decision -- perhaps by the extensive use of locking devices requiring coded combinations from responsible military commands for their release.

In the early period, to improve the deterrent, we should disperse the highly concentrated B-47's to domestic fields on an emergency basis, in an operation modeled on SAC's overseas "Reflex," fly an emergency airborne alert of B-52's, and, both to deter and to fight a general war, we will need to increase the number of hardened delivery vehicles more rapidly than is presently intended. This can be accomplished in several ways. One of several under study at RAND at the present time includes a sharp acceleration in the production of hardened Atlas missiles and the sheltering of some of our bombers. For the purpose of fighting a war and

limiting damage to the United States, our defenses need to be protected from attack. This means, in particular, that vehicles, data processing, and communications for defense need to be hardened and dispersed.

For the middle Sixties and after, we are investigating a variety of mobile strategic vehicles: land mobility for the Minuteman, the use of barges, as well as further extensions of the Polaris submarine concept, and the nuclear-powered CAMAL. One promising, but as yet unproved, possibility is a very long-endurance chemical aircraft serving essentially as an airborne ballistic missile launching platform capable of operation for three to five days without refueling. For the counterforce mission, it appears to us that large missiles with larger yields and better accuracies (logical developments from Atlas and Titan) may prove superior to the Minuteman. Space technology should have many important applications of which it is likely the earliest will affect reconnaissance, warning, and communications.

It will be apparent from this description that we believe the Air Force will continue to play the major role in the U.S. posture for general war.

5. The size of the strategic effort.

The upshot of these considerations on the requirements of the United States military posture for general war is that these requirements are too stringent to permit the kinds of reduction in the strategic budget suggested by the advocates of Minimum Deterrence. And, in fact, they dictate some expansion.

OBJECTIVES FOR LIMITED WAR

1. Are the forces which are capable of fighting and deterring a general war adequate for countering the limited war threats which will face us?
2. Should we rely mainly on nuclear weapons for the defense of third areas?
3. Even if it appears to be within our interest to protect third areas primarily through the use of non-nuclear forces, is it feasible to do so?

From the preceding summary, it will be clear that we do not think a limited war capability can be safely obtained at the expense of our strategic force. On the other hand, we strongly doubt that the threat of limited aggressions will permit reducing our efforts to counter them or will permit a solution simply as a bonus or by-product of our efforts in the general war area. While a nuclear response to some limited threats is possible -- and it is clear that the U.S. must have the capability to use nuclear weapons in peripheral conflicts -- we do not believe that the full variety of non-nuclear aggressions, ranging from subversion and guerrilla warfare at one end of the scale to the use of conventional, proxy or even Russian land forces at the other end, can be met with nuclear weapons. Moreover, where an ally may choose to be defended by nuclear weapons once, the next occasion -- whether for the same or another ally -- may be less welcome. It is important to be capable of a wide range of response ourselves and to be able to aid our allies to respond in a variety of ways, including some not easily open to ourselves. Research and development in

limited warfare need expansion. R&D on non-nuclear weapons systems in particular is at a very low level in all three Services. Finally our work indicates that land-based air forces have an important role in many types of limited war. The argument that it is infeasible for the U.S. and its allies to meet limited or peripheral objectives with a less than nuclear response without risking "bankruptcy" is without basis in fact.

BUDGETS

1. Do the risks of general war and the dangers of limited aggression indicate an increased national security budget?
2. Would such an increase "endanger the American way of life?"

One current view has it that we should spend less money on deterrence, none on counterforce, or active or passive defense of cities, and take up the slack in expenditures on limited war forces. The opposing view generally calls for more money on deterrence and counterforce and less on limited war. All of these positions are influenced by the belief that increased budgets are economically infeasible or, at any rate, would have drastic political consequences for our way of life.

In general such a belief is not advanced by professional economists nor supported by any serious economic analysis. A succession of competent professional economists have pointed out that the contrary is the case. In the last twenty years the defense budget has formed a fraction of our gross national product varying in size from about one per cent to well over forty per cent. During the Korean War, shortly after it had been argued that an increase to 14 or 15 billion dollars would endanger our way of life, the defense budget rose to some 60 billion dollars without any

drastic consequences for the American way. Finally, professional economists agree that, if the risks justify it in the coming years, an increase in our annual defense expenditures on the order of 10 or even 20 billion dollars could be absorbed without either a substantial deterioration in our standards of living or (provided the increase was not made too suddenly) the introduction of substantial controls. Whether or not the American people would accept even mild sacrifices will depend on their understanding of the risks. In fact, the usual argument for the importance of holding the budget constant is itself an oblique way of expressing a judgment that the risks are not large. In our opinion, they are very great and it is important that the dangers be more widely understood. For this reason we should avoid depreciating the dangers either of general or of limited war.

I. OBJECTIVES FOR GENERAL WAR

How much and what kind of effort is required to deter general war? Need we prepare to fight a general war? Is there a role for counterforce and for active defense? These questions have been raised in acute form recently by theories of "Minimum" or "Finite" Deterrence. Before sketching in rough outline the kinds of program required for our strategic forces, it is useful to develop the answers to these questions in the form of a critique of "Minimum" Deterrence.

This critique is undertaken, not for partisan reasons, but because the theory does raise these fundamental questions. And while Minimum Deterrence theories are especially current in the other Services, it appears to us that many of the views presented by opponents of Minimum Deterrence lack internal consistency. For example, it is sometimes held that offense forces on both sides will almost surely be so invulnerable that no surprise attack could moderate significantly the extent to which they could destroy the aggressor nation. Yet it is held, frequently by the same people, that our own counterforce and active defense, operating under much less favorable conditions, even without the benefits of striking first by surprise, can make a meaningful difference in the extent of destruction to ourselves. In other words, it is implied that a first-strike counterforce operation can accomplish nothing substantial, but that a counterforce response to an attack can help us survive, conclude the war on favorable terms, and recover from the war. A self-consistent theory of the requirements both for deterring and fighting a general war will encompass the need not only for an ability to survive the enemy's counterforce operation and to retaliate significantly but also the ability to employ a counterforce operation which

has a meaningful potential for ourselves. Such a theory will be indicated in the course of the critique of Minimum Deterrence.

A. "MINIMUM" OR "FINITE" DETERRENCE THEORIES

Such theories, as currently presented,* have three elements: two, wrong; one essentially right, and of great and neglected importance. The sound element of the theory has it that our retaliation should be controlled, with some strategic power reserved beyond our first response in order to help conclude the war. This component of the theory, as will be shown, is not strictly compatible with the other two. Consider, to start with, the first two elements of the Minimum Deterrence theory. The first is the belief that deterrence is fairly easy to come by, that it involves assuring only small damage to an aggressor -- which is taken to mean that we need only small, inexpensive forces** for the purpose and in fact that our large, expensive ones will needlessly "overkill" the targets. ("There is no need," we are reminded, "to kill your opponent more than one time.") The second element has it that the capability to deter general war is all that we require of our strategic power and in fact all that we need as preparation in the line of general war. Comments on each of these follow:

*See, for example, P. H. Backus, "Finite Deterrence, Controlled Retaliation," U.S. Naval Institute Proceedings, Vol. 84, No. 3, March, 1959. Another earlier, very lucid presentation of the Minimum Deterrence theory occurs in George W. Rathjens, "Deterrence and Defense," Bulletin of the Atomic Scientists, Vol. XIV, No. 6, June, 1958.

**See, for example, Rathjens, p. 227, "If the requirement is for delivery capability for a hundred or so missiles the costs would probably be in the hundreds of millions of dollars per year; certainly not more than one or two billion."

1. The Supposed Ease of Deterrence

On the ease of deterrence. How much damage must we be able to assure? Would the prospect, for example, of ten million dead be enough to deter the Russians in all the contingencies likely to arise in the Sixties? The 135 most populous Russian cities have about forty million inhabitants, roughly one-fifth of the total Russian population. A loss of some ten million, which would amount to about one-twentieth of the total Russian population and a little over a tenth of its urban population, would result, therefore, from a destruction of one-fourth of the inhabitants of the largest 135 cities. While there are variants, this seems to be the order of damage contemplated by proponents of the Minimum Deterrence theory.*

*a. The study done at the U.S. Naval Ordnance Test Station, China Lake, California, called The Vulnerability of Complex Targets to Nuclear Weapons, NOTS 1901 (SRD) 17 January 1958, is a basic reference in connection with the target aspects of the Minimum Deterrence theory. The criterion used there was a 25 per cent fatality level in the 50 largest Russian cities. The 50 largest Russian cities have about 29 million inhabitants. On the basis of the analysis contained in NOTS 1901, the authors suggest that the yield-delivery capacity required for deterrence even "under the most severe condition of 90 per cent combat degradation...is some two orders of magnitude less than current planning estimates."

b. In another report (The Analysis of a Submarine Ballistic-Missile Weapon System for Deterrent Warfare, NOTS 1716 (SRD) U.S. NOTS, China Lake, California, 28 February 1957) the NOTS group holds that "...the assured capability of one-third destruction of...76 of the major Russian cities is considerably more than is needed for deterrence." Also, "the 33 per cent level of expected fatalities applied to a significant fraction of the Russian urban complex will guarantee...deterrence." One-third of the population of the 76 largest Soviet cities is 11 million.

It should be noted that these studies take the primary objective of our retaliation to be not killing people but (1) achieving that level of fatalities within a city which means the "effective destruction" of the city, and (2) attacking enough cities to eliminate the possibility of inter-urban help. But this objective is more relevant to a mobilization war on the World War II pattern than to a general thermonuclear war. There

It has been pointed out that in World War II the Russians suffered a population loss more than double this and extensive damage to their economy, and yet recovered very well. It is not intended, however, to suggest that damage of this extent would be regarded lightly. The point to be made is that deterrence should not be viewed as an absolute. It is a matter of comparative risks. Under some circumstances an aggressor might be faced with several unpleasant alternatives, and we would like to guarantee that the most unpleasant always appears to be the risk of making an attack. There will be many explosive circumstances in the future in which, for example, the Russians may weigh this high probability of ten million dead against what they regard as a very strong likelihood of the United States striking first and leaving perhaps as many as 150 million dead. We would want them to sweat out the imagined, uncertain dangers of the U.S. striking first -- in spite of the enormous catastrophe this would bring -- rather than risk striking first against the U.S. and suffering our retaliatory blow. But our promised retaliatory blow, then, needs to be large and highly certain, if it is to deter them. Decisions might be taken in haste and in an atmosphere of confusion. False information and ominous lapses of

seems to be little question that the level of damage assumed would effectively prevent any substantial amount of war production. But, it would hardly prevent post-war recuperation over a long period -- especially with the outside aid that military supremacy could command. No quantitative analysis was made in the NOTS study of the recovery problem. On this, see RAND Report R-322-RC.

c. Rathjens, p. 227, talks of the need for "a delivery capability of a hundred or so missiles," suggesting a target list smaller than one hundred.

d. Backus refers to some two hundred targets. The two hundred most populous Russian cities have about 47 million inhabitants. At 25 per cent damage levels, the Backus numbers would come to less than 12 million.

communications have often characterized the hours during which momentous war decisions of the past have been made. The dis-incentives for striking first must show clearly even through this fog. There are, moreover, many foreseeable contingencies which will put a great strain on the deterrent -- in which we will nonetheless want him deterred. For example, the Russians may be faced with a catastrophic defeat in a peripheral war. Or they may fear allied intervention and support for a revolt spreading in the Satellites or in Russia. Or, possibly even more dangerous, we may have suffered some catastrophic defeat on the periphery, and they may doubt that we will accept such a loss. For the Russians, who take a long view of history, a blow from which they might recover in less than ten years may not invariably be deterrence enough.

On the other hand, it should be clear that the extent of destruction whose prospect would be an adequate deterrent under all reasonably likely circumstances is not a precise hard number. Numbers like ten million dead, which are not completely outside the range of Russian historical experience, seem definitely too small; 150 million more than enough. No exact line can be drawn. Yet from the considerations outlined above, it appears clear that there are plausible contingencies in which our deterrent power may not be operative if we cannot assure the Russians with a high degree of confidence that they will suffer fatalities many times ten million and a setback in their economic life for at least a generation. Given all the uncertainties as to how they may calculate the risks, this statement seems none too conservative. Furthermore, as we shall discuss in the next section, the expectation of urban damage is not the only deterrent. The Russians value their military power and, if properly safeguarded, our ability to

threaten the destruction of this power can make an important contribution to deterrence. In any case, as we shall make clear, we do not believe that there is an absolute or guaranteed deterrent. (It is worth mentioning that by 1970 we shall be thinking of deterring China and the requirements here for population loss and economic setback are likely to be very different.) The outcome of these considerations is that the damage requirements for deterrence make the job quite a bit more difficult than if we merely had to assure damage to one-fourth or one-third of a list of the largest Russian cities.

However, the principal point to be made about the supposed ease of deterrence is that administering a given amount of damage in retaliation is a very different thing from accomplishing the same damage in a surprise attack. The calculations of huge "overkills" neglect in general the distinction between a first and second-strike capability. Or make only a formal allowance for the difference.* The problem of maintaining a second-strike capability involves a serious consideration of much more than merely the size of our forces in advance of an attack. We must ask how are they disposed, on how many points, and how easy are they to find? What degree of protection have they against blast, radiation and other weapons effects? What arrangements have been made for detecting and identifying the large variety of feasible attacks and for recognizing them as attacks when

*Sometimes the "overkilling" argument is a more technical one concerning appropriate or best target allocation, assuming the weapons are delivered. In the above we do not intend to make any brief for the current target allocation, which may well be far from optimal. However, with perfect target assignment, "kills" enough to form an objective basis for deterrence are not guaranteed in the Sixties. If the target assignment is less than perfect, the inadequacy would be greater.

they occur? What mechanism has been set up for decision on the response? What provisions are there for coordinating a retaliation under conditions of attack, and for penetrating enemy active and passive defenses? Such considerations very significantly affect the size of our forces after an attack and their realistic capability for response. When one examines this quantitatively, it becomes apparent that nothing in our present plans assures an overkill of Russian targets and, in fact, unless we alter and expand the program so far committed, there is serious question as to whether we can guarantee destruction enough to deter the enemy in many circumstances that may arise in the early Sixties.

But it might be argued, if we cannot overkill with all that expensive strategic capability, perhaps it is because we have been rather stupid. The problem, it is sometimes contended, is easy. It is soluble simply by keeping our weapons in motion. And in fact mobility is even held to be able to take us out of the arms race entirely. The argument goes that a finite number of fixed points of the defender can be matched by some finite number of offensive vehicles of the aggressors, and if the defender tries to outmatch the prospective aggressor by building more points, this leads into the spiral of the arms race. On the other hand, moving points in the air, on the ground or water are presumed by this argument to be invulnerable; -- or relatively invulnerable, which is both more cautious and more obscure.

Now we suspect that mobility will be an increasingly important component of the deterrent posture. We think a B-52 air alert should be flown as an emergency measure; that Polaris is an extremely promising system; and that there are interesting possibilities for a long-endurance chemical airborne mobile system. (This idea, which will be described later, has been incubating for over a year at RAND.)

However, mobility does not end the game. Even a moving platform that launches ballistic missiles in sequence against an urban target system is subject to countermeasures. This is particularly true if we are talking about a small force of moving platforms against which the enemy can concentrate his efforts. The platform might be tracked, or hunted and killed before launching any birds. Or it might be killed after a first launching has revealed its position and before it has expended all its birds. Or the birds themselves -- especially if penetrating singly and with little aid -- might be killed by active defenses. Or the target population might itself move, help solve its problems by walking --away from the target area and perhaps into shelter.

But it may be objected that this could be very costly to the enemy, force him to great and possibly infeasible expenditure. So it may. But that would mean that the arms race would favor us, not that there would be no race. Our object is to select feasible measures that force infeasibly expensive countermeasures. Whether or not we have a mixture of measures that will accomplish this is an empirical matter. In the case of many of the newer systems, which are still in R&D, the outcome depends on many variables that are not yet known.

Finally, mobility cannot solve all of the problems because the weapons carriers and the launching platforms, which are the prime candidates for movement in the suggested measures, are only parts of a system for retaliation. Most important, the elements of political control, the key decision makers, their instruments for obtaining information and transmitting decisions, cannot all be kept afloat or in the air. This point is treated at length below (p. 29), because it is central, not only in the

business of assuring retaliation, but also in the problem of avoiding outbreak of war by miscalculation, and in the problem of fighting a war, in case deterrence fails. There is no better way to glimpse the real complexity of the problem of deterrence than to consider carefully the problem of preserving political and military command and control.*

*One other advantage frequently claimed for mobility -- that it draws fire away from rather than toward our cities -- calls for comment. Movement on air or water is generally intended here since movement on land might call for an aggressor's smearing overpressures rather widely over the landscape to make up for such uncertainties in location as might be introduced by movement on land. (The extent of uncertainty may be rather limited if, as is likely, these movements are subject to covert observation and reporting.) But, though of course some fire will be drawn away, even for air and waterborne systems the claim is sometimes exaggerated. For one thing, it ignores the large proportion of these mobile vehicles that at any given time are in maintenance and not moving. For systems so far proposed, this proportion varies from 40 to over 90 per cent or so of the total, depending on what method of mobility we are talking about. In any case, such substantial fractions of the force could not be ignored by the enemy and would have to be attacked at home. Further, while some of the command and communications centers needed to control the mobile part of our force might conceivably be spared, our system of command and control is very likely to be attacked by the aggressor and could scarcely be hit without great damage to our cities. Finally, it is misleading simply to contrast the fire as being drawn to our cities in the case of hard fixed points and away from them in case of mobile systems. A hardened fixed point system of retaliatory bases in general is located some distance away from cities. Diverting attack to them reduces the number of civilian casualties. For example, several map exercises done for the year 1963 showed that the further hardening of SAC might reduce fatalities by 40 million compared with the damage done given only the programmed SAC. The extent of the reduction in fatalities is of course sensitive both to the details of our posture and to enemy capabilities and choices. In the cases studied we used a system of bases chosen quite poorly from the viewpoint of minimizing population damage; the enemy was assumed to have the capability projected by intelligence.

2. Counterforce, and Defense in General War

The preceding remarks have all been directed at the first element of the theory of Minimum or Finite Deterrence, namely, the notion that deterrence is easy, and that there is some simple device that will provide it. The second element of the theory has it that the ability to retaliate on Russian cities is the only general war capability needed: the counterforce mission is not needed, since we can deter the enemy's attack by threatening his cities; in any case, if he did attack, the counterforce mission would still be useless, since his missiles and bombers would already have been launched. Similarly, active and passive defense of cities is regarded as unnecessary and infeasible.

Can we dispense with a counterforce capability and with the defense of cities? The answer is No. But the argument does perceive correctly that counterforce and active and passive urban defense are complementary. They require analogous justification. What is the justification? The most unambiguous justification concerns their role in case deterrence fails.

If we give any credence to the possibility that deterrence may fail, if we are not completely certain that there will be no war as the result of either a correct or incorrect calculation by the aggressor, we must insure ourselves against this contingency. The disaster, if it occurs and we are totally unprepared to diminish it, may well result in upwards of 160 million dead. Moreover, the less certain we are that war will not occur, the more insurance we require.

Even if, at some given state of the art, we have a high confidence deterrent, war may still come. First, because even if the state of technology is unchanged, a high confidence is not the same as certainty, and second,

the technology may change, making deliberate attack a likely event. And, finally, even if a deliberate attack is unlikely, accidental war, or an attack by miscalculation, cannot be excluded. Naturally, none of these observations is intended to disparage the importance of the deterrent. Deterrence is vital. It reduces the likelihood of general war, but it does not eliminate the possibility. Therefore, we must insure against the contingency of war by having the ability to limit the damage in case war comes.

But can counterforce and urban defense do any good? Against an intelligent and serious enemy possessing the great advantage of secrecy possible for a dictatorship, these measures cannot prevent catastrophic damage with any assurance. On the other hand, even if the enemy attack is well planned, they can significantly reduce the damage. Contrary to many statements current now, a study of sensible Russian strategies of surprise attack shows that such strategies generally involve using very much less than the total of Russian forces in the first wave. This is important for the enemy to avoid giving warning. For this reason alone it is unlikely that, given a rational enemy strategy, all the birds will have flown, that all the bomber and missile bases will be empty. But there is another reason. As we shall discuss in connection with the third element of the Minimum Deterrence theory, a rational strategy, both for ourselves and for the enemy, requires the ability to pose a military threat not only before the opening strike but after it. Since this means reserving some military force, for this reason also, there will very likely be something to counter.

But the enemy's strategy may not be sensible, and this too could provide an opportunity for counterforce attacks. For example, enemy bomber and missile

bases might be poorly protected, and while we should not count on this, we should be able to exploit such errors if they occur. His bomber home-bases are quite vulnerable now (they have little radar warning, are soft and may not be highly alert) and may remain so. A considerable part of his bomber force depends on quite vulnerable staging bases. (On the other hand, prevalent conceptions for attacking his force are dubious. It is questionable whether they exploit adequately the vulnerabilities described above. They usually assume that a U.S. first strike must attack initially a very large target system. But such an attack would involve massive movements of forces which almost certainly would give him strategic warning long before we reached his radars. This suggests that it is wrong to associate the counterforce mission too exclusively with the use of manned bombers. Ballistic missiles appear to have an important and perhaps a central role in the counterforce mission.) Even if his missile bases are very much better protected than his bomber bases, the elimination of the bombers alone has considerable significance, since it can be shown that his use of bombers in conjunction with missiles can result in especially extensive and heavy damage. We cannot, of course, count on his inertia, but neither can we ignore the likelihood of its continuance. Indeed, if he behaves no more intelligently, in this respect, than he has in the past, it is likely that by 1965 we will know, at least approximately, the location of most of the Soviet fixed missile sites. Through a number of intelligence techniques and the use of satellite reconnaissance, the location of many may be rather exactly known.

His attack itself may be poorly planned and coordinated, in which case it will be particularly liable to disruption and attrition by both our offense and our defense. This is especially likely, moreover, in the event of war as the result of accident or miscalculation, one of the eventualities

that cannot be excluded by the deterrent. (The better the deterrent, the more likely that any war that does occur will occur by accident.) Under any of these circumstances, a well designed cooperation of counterforce and active and passive defense can make a significant difference in the size of the disaster suffered by our population. By "significant" is meant the difference, for example, between 60 and 160 million dead, and an even greater difference in damage to structures, equipment and stocks. Such differences may seem much too modest to impress some readers. Just what, it may be asked, is the difference between two such unimaginable disasters as 60 and 160 million Americans dead? The only answer to that is "100 million." Starting from the smaller losses, it would be possible to recover the industrial and political power of the United States. Even smaller differences would justify an attempt to reduce the damage to our society in the event of war.

Could any feasible difference in our defense policies make such a large difference in the damage we might suffer? Preliminary results of some of our studies indicate that it might. Consider, for example, a war begun by the Soviet Union in 1963, not in a precisely coordinated way, but perhaps as a result of a miscalculation. If in this situation we attempt no counterforce attack and have no effective active air defense or civil defense, over 80 per cent of our manufacturing industry and 160 million people might be destroyed. The result is even worse for calculations giving the Soviet Union credit for the sort of repeated bomber attacks that are feasible where a defenseless country permits "free rides."

What, in this circumstance of outbreak, would be the effect on the survival of the country if we were to take three kinds of action:

(1) to protect our strategic force better, (2) to adopt a modest counterforce capability, and (3) to shelter our planned active defenses in order to protect them against ballistic missile attack? The first of these actions forces the Soviet Union to allocate a larger proportion of its attack against our better prepared strategic force (if it chooses to go to war at all in the face of our improved retaliatory power); the second enables us to kill some of the Soviet offensive force on the ground, even when it strikes first; and the third increases the effectiveness of our air defense against follow-up bomber attacks. Together, it appears, these measures might limit our damage to about 10 per cent of our manufacturing industry destroyed and about 60 million people killed. With this lower level of damage, the nation would very likely be able to recover, while with the higher damage level we probably could not recover as a nation. A fourth kind of program could further reduce our damage. In the attacks tested, if we possessed fallout shelters for our population our casualties would have been reduced to about 30 million.*

Some of the current confusion about the counterforce objective stems from a failure to distinguish, once again, between the demands of a first strike and those of a second strike. To strike first, deliberately, calls for the ability to destroy a high proportion of the enemy's retaliatory

*It should be stressed that while the case discussed is quite a plausible one, in some respects it probably credits the enemy with too great a capability. On the other hand, it is possible that we might fare worse. In any case, the capability we are treating is not a high confidence one.

forces, leaving only remnants which might be contained within acceptable bounds by active and passive defense. But a second-strike counterforce has more modest goals. Here we want simply to come out as well as we can. To prevent his making ferry trips and dropping bombs at leisure over the country, we need an ability to disrupt his attacks and maintain some semblance of defense, which is itself well enough protected to last as long as his attacks are coming.

The argument outlined here is quite different from the one put forward by defenders of the counterforce mission who regard a counterforce capability as a simple and unambiguous part of the deterrent to general war, in fact, its foundation. Deterrence is definitely a good thing, and therefore we tend to include under this head almost anything we might want to advocate -- even some things that work against the deterrent. Both a counterforce capability and the active and passive defense of cities carry with them some danger of destabilizing the deterrent balance. It is now rather widely understood that a strategic force capable of preventing the enemy's retaliation and prepared mainly for this goal might, in some contingencies, move him to aggression unless we could assure extensive retaliation. If our strategic force could eliminate the enemy's strategic force by striking first, but could easily be eliminated provided the enemy struck first, this balance would be extremely unstable. Our vulnerability would invite him to attack. Our ability to eliminate his force would give him reason to believe that, since we could emerge unscathed by attacking him, this idea would very likely occur to us and that he had better strike quickly. It may appear paradoxical that not only counterforce but city defense also could, under some circumstances, introduce elements of instability--and so increase the probability of our being attacked. However, similar reasoning suggests

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that an active or passive defense substantial enough to play a key role along with counterforce in precluding retaliation might also have a role in upsetting the balance. If by counterforce alone we could not preclude his retaliation and our active and passive defense could not handle that part of his force which our counterforce attack left undestroyed, we would still be deterred. Therefore, he would have less reason to feel that we'd attack. On the other hand, if our active and passive defense complemented our counterforce capability so adequately that we could be reasonably sure of emerging unharmed, then he might feel that he had lost his ability to deter us. Under this circumstance, depending on how much he can destroy of our retaliatory force, he might try aggression. Our retaliatory strike, since it would be launched after his aggression, will damage him less than if we struck first. Stability depends, therefore, not only on the relative degree of damage the enemy would suffer in these two contingencies, but on the relative likelihood of the two events, his assessment of the odds on whether we will strike first or wait to strike back. He may think that we are less likely to wait if, by striking first, we can preclude his doing extensive damage. Up to now these remarks have not emphasized this very troubling situation.

Insofar as we can limit the damage to ourselves we reduce his ability to deter us and, therefore, his confidence that we will not strike first. But decreasing his confidence in our not striking increases the likelihood of his doing so, since striking first is nearly always preferable to striking second. And so any attempt to contain the catastrophe if it comes, also in some degree, invites it.

We need a combination of counterforce, active defense and passive defense as insurance, in case deterrence fails. At the same time this contingent capability places an extra burden on the deterrent itself. This is just one other example of the complexity of the problem of war in the thermonuclear age. But if such a contingent capability can be large enough to be worthwhile, as we think it can be, might it not be large enough to remove his power to deter us? An intelligent and serious enemy can do more to protect himself than in the case we have illustrated and therefore we believe can assure destruction on the order of 40 or 50 million even if we strike first. If the counterforce capability and a hardened defense might make the difference between 40 and 160 million dead, the answer to the question of destabilization is that the lower limit to which we might aspire is still a catastrophe so large that we would hardly undertake it lightly. If so, then the amount of instability introduced by the counterforce and by city defenses appears no more than tolerable.

What is more, counterforce and active and passive defenses have a favorable as well as an unfavorable interaction with our ability to deter attack because they strengthen our ability to fight a war to a successful end. Besides their population and economy, the Russians value their position as a first-rate military power. In fact their military pre-eminence supports their political and economic expansion and would be a defense against further losses. Military pre-eminence is worth a considerable amount of economic resources. Before attacking, the Russians must give some consideration to the amount of their military force that will survive by comparison with forces available to their enemies--and their allies (e.g., China). Military power might command capital and stocks

from outside the country as an aid to recovery of the Russian domestic economy. The Russians might be willing to accept a larger number of casualties if they anticipate a military victory and the preservation of a core of military power than they would if they can anticipate no more than a stalemate.

Furthermore, if we have the ability to destroy enemy military forces as well as cities, this strengthens the deterrent in that it makes it more credible that we might not only threaten, but actually destroy enemy cities. We could then both destroy what he values and limit his destruction of what we value. Suppose we were to have a marginal capability barely able to damage his cities beyond an amount which he regards as tolerable. Would he believe that we would divert none of this force to limit the size of the catastrophe to ourselves? And that we would reserve none of it? Perhaps. But it would be safer if we made it clear to him that we have some capability to do all three.

To sum up, first, the counterforce capability and defenses are vital complements to an ability to retaliate against the enemy's population and economy because deterrence may fail. Second, a counterforce capability and the active and passive defense of cities is compatible with the ability to deter a well-planned surprise attack. This is true in part because the insurance they provide is limited. They do not really remove a resourceful enemy's ability to deter us except in extreme circumstances, and so the element of instability they introduce is itself limited. Third, as an addition to our ability to retaliate against his cities, they work for the deterrent (a) by promising the destruction of something the enemy values greatly -- namely, his military power -- and (b) by providing us with the freedom to attack his cities without completely abandoning all

attempt to limit the size of the disaster to ourselves. Fourth, a counterforce capability and active and passive defense not only can add to the ability to deter a well-planned surprise attack but also can deter Soviet political advances; and in addition it may provide the basis from which U.S. opportunities for political advances could be exploited.

3. Controlled Retaliation

Advocates of the Minimum Deterrence theory sometimes* have made another point quite distinct from the two principal ones discussed so far: that retaliation should be controlled in the sense that we should leave some of the enemy's cities undamaged by our first response so that we can threaten the remainder as a means of concluding the war. This view is sound and very important. Whether the war starts by accident or design, we have to take seriously the problem of terminating it, just as we must face the problem of limiting damage to ourselves in the event that war occurs. Moreover, it will be obvious that a policy of controlling retaliation against enemy cities is quite compatible with a sensibly administered strategy of limiting damage to our own cities by means of counterforce and urban defense. In fact, the process of bringing the war to an end as favorable as possible for ourselves will depend on the comparative ability of each side to do further damage to the other. Destroying part of his military force while maintaining a continuing capability to defend ourselves against the rest of it will improve our bargaining position in terminating the war. Belief in the need to control

*See Backus, op. cit.

retaliation is therefore entirely consistent with advocating counterforce and urban defense. (On the other hand, it is not consistent with the arguments made by the theorists of Minimum Deterrence that an enemy presumed also to be rational will have expended his entire force in an opening blow and therefore will leave nothing to attack.)

But in the requirement to control retaliation the problem of preserving control is most evident. By definition, controlled retaliation implies continuing control. As has been suggested, this is a critically difficult problem. The problem of preserving control over our own forces is grave even for the minimal function of an initial retaliatory strike. This problem is still more serious for the problem of fighting the war to an end. One frequently unnoticed part of the latter problem is the need to preserve not only our own control but elements of the enemy's control over his forces if the termination of the war is to be made effective. All of this has implications for the problems of target selection and war planning. The simple contrast between city busting and counterforce as rational alternatives will not bear up under examination. We cannot pick one of these alternatives and develop a reasonable plan for any single set of conditions at the outbreak of war, still less under the large variety of circumstances of outbreak that are possible. To deter a well-planned surprise attack, we must be able to threaten some critical combination of his political, economic, and military power. To conclude the war on the best terms possible, we want our first strike to leave some element of his civil society as a hostage to our threat to continue the war. This may mean at the outset, preserving some of his cities so that the threat of their destruction may help us conclude the war. In order that the termination

of war may be effective, we have to think of the problem of communicating with his decision centers and his vehicles. (On the other hand, particularly in the early phases of a war, we would like to disrupt the coordination of his attacks and leave him some communications -- or restore them after blackout -- only where it will deflect the continuance of the attacks.) To limit damage to ourselves as well as to conclude the war, we must make his military forces and specifically his delivery vehicles our target. Finally, we need the ability to control our response so that we can act on broadly different plans adaptable to broadly different circumstances of the war's outbreak.

It will be evident from the preceding that the problem of controlling retaliation to help conclude the war complicates the already hard task of assuring enough retaliation to deter the initial surprise attack. More than anything else it makes it apparent that deterring general war is not easy.

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One outcome of this consideration of the Minimum Deterrence controversy, then, is that we have other objectives in the general war area besides deterring general war. If deterrence fails, we want to limit damage and to conclude the war as favorably as we can.

A second outcome: the discussion earlier (pages 7 and 8) of Minimum Deterrence and the arms race, suggested that enemy counter actions to both fixed and mobile systems are always "finite." Some may be too large to be feasible in the time available. This leads into our next section's discussion of Soviet capability and U.S. alternatives. We want to test alternative programs for the United States against all enemy countermoves which are feasible -- that is, within his capacity to choose.

B. SOVIET CAPABILITIES AND INTENTIONS AND U.S. ALTERNATIVES

1. Soviet Intentions

The following section examines uncertainties in Russian capabilities as a preparation for describing several alternatives for obtaining high confidence capabilities for ourselves. First, however, since there is an influential current opinion that lays great stress on Soviet doctrine and intentions as distinct from Soviet capabilities,* it is worth saying something on the subject of Soviet intentions. One support for the view that deterrence is not very difficult is found in a new version of the Balance of Terror theory, which has it that even if the Soviets could deliver a surprise attack which precluded our effective response, they would not -- essentially because Soviet doctrine excludes preventive war.

Much of this analysis of Soviet doctrine is based on a rather literal reading of Russian unclassified texts. Of this it can be said that it seems naïve to take at face value any distinction made between "preemption" and "prevention," even if it were made in much more closely guarded texts than any available to us. One could hardly expect an explicit avowal of an intention to wage preventive war. But in any case these predictions of Soviet behavior are suspect because they are unconditional. They do not envision circumstances in which unpleasant alternatives are thrust upon the Russians. However, predictions of enemy intentions must be contingent on the alternatives confronting him.

They will also depend strongly, though not exclusively, on the specifics of our posture and that of the enemy. His intentions will vary with

* Garthoff, R. L., Soviet Strategy in the Nuclear Age. Compare the sections on enemy intention in the National Intelligence Estimates.

alterations in our posture and his. This is a basic presupposition of deterrence theory. In constructing a deterrent force we are trying precisely to choose a posture that will affect his intentions, induce him again and again, whenever the choice presents itself, to reject a surprise attack on us as the worst of any unpleasant alternatives he faces. But this means that Soviet intentions inferred on the assumption of an invulnerable U.S. posture cannot be used without circularity to justify the comforting notion that even if our posture should be vulnerable, they would not attack. In fact the view that Soviet doctrine rather than Soviet capability inhibits or precludes preventive war is based on exactly this circularity: first, it is supposed the Russians would reject preventive war because they are against adventurism and (it is assumed implicitly) their surprise attack would inevitably be answered by our devastating Russia -- which is what makes surprise attack adventurist. In fact, this implicit assumption is merely a repetition of the stereotypes of Western thinking on the "automatic balance of terror," "nuclear parity," etc.* Then when the stereotype of the automatic balance of terror is called into question and the possibility is raised that, unless our own efforts are expanded, the Russians might prevent our retaliation by striking first, Soviet doctrine is called on to suggest that, even if they could, they would not attack. But this conclusion forgets the assumptions about Russian and U.S. capabilities on which it is based.

* Garthoff, R. L., op. cit., p. 13. "The general political-geographical and weapons aspects of the arena by 1960 can perhaps be assumed by projections of current trends. Most important, if it is indeed not here already, nuclear parity, including strategic missile and aviation deliverability, will have arrived."

While it can be extremely illuminating to examine Russian pre-dispositions, and it is very important to do so, such an analysis cannot yield predictions without a substantive consideration of Russian and U.S. capabilities. We turn next to such substantial issues.

2. Soviet Capabilities

In measuring the adequacy of the current U.S. program as it is committed so far, RAND has used current expectations as to Russian capability. The current program is inadequate against the expected threat. What makes the problem more severe and excludes any very simple remedy is that there are large and intrinsic uncertainties in our expectations of enemy force structure and performance.

It is a usual practice to take some single number as indicating the amount of a given vehicle type the enemy may have at some given date. And similarly for his delivery accuracy and the yield of his missile warheads and other performance characteristics. Sometimes a small range is allowed for error on either side of the expected. But such estimates seldom face up to the full range of uncertainty in the expected numbers, and the implications of this uncertainty for the design of a high confidence deterrent and fighting posture. Many of these numbers are intrinsically uncertain, not merely because of any lack of intelligence information, but because they are still subject to future enemy choice. His choice may confound a posture of ours, designed on the assumption that he would not make this choice. For this reason alone, to achieve a stable high-confidence capability, we must look not merely at the expected numbers, but at the choices open to the Russians to interpose difficulties at each and all of the many barriers to retaliation and to the pursuit of the war to its end.

In consequence, RAND has not been satisfied to test the various alternatives contemplated in terms only of the expected Russian capabilities. These calculations have been concerned to see how Polaris fares, for example, if the enemy buys a patrol of aircraft using air-to-surface missiles with nuclear warheads and using infra-red and radar ranging to locate the approximate position of the submarine after the first firing; and how both Polaris and our first-generation intercontinental ballistic missiles would make out against a first-generation ballistic missile defense. The small force of air alert B-52's, which RAND finds to be a part, but not the whole, of an adequate expanded program, has been matched against Russian area defenses with an augmented low altitude radar coverage and against an expanded local defense of the Hawk or Hercules type. For all of these program alternatives, the study has been examining the implications of Russian civil defense programs, ranging from the simplest, which involve merely evacuation beginning at the scheduled time of detonation of the first Russian bomb, through shelter programs of varying cost. And various projected U.S. systems of fixed missile launching sites and bomber bases, both hard and soft, have been matched against an expanded Russian ICBM program.

Wherever possible, the study tries to take into account the constraints imposed by the state of the technical arts, and to recognize explicitly the uncertainties as to what this state of the art will be. It attempts to consider not only the over-all constraints placed on the Russians by their budget of resources, but also the frictions and practical limits placed on the reallocation of these resources in any given period of time.

When we explicitly recognize such alternatives as open to the Russians, it is possible to calculate their effects on the alternatives for ourselves. We find that modest alternatives embodying some one simple remedy will not survive an enemy granted this realistic flexibility. Feasible increases in the offensive Russian ballistic missile force can wipe out an increase in the number of targets we present to him, if we were to obtain this increase simply by a proportionate increment in our total force, or simply by dispersal. The same is true for each of the unmixed or pure remedies. Again, it appears that a small air alert force penetrating singly or in very small cells will find it difficult to jam enemy radars or obtain adequate other aids to penetration and might be countered by fairly modest defense expenditures by the Russians. And it appears feasible for the Russians to intercept most of a small U.S. ballistic missile force, if these missiles do not devote a considerable payload to defense against such interception. (It is not as hard to work out an active defense against retaliation as it is to defend against surprise attack. This is true whether the retaliatory force is made up of missiles or aircraft. The retaliatory force will be reduced, before penetration, by the enemy attack. It is not likely to be well coordinated. It will face an alerted defense. The problem of defense against ballistic missiles, which has turned out to be so recalcitrant, is not that of intercepting the naked missile. The problem centers in the variety of aids to penetration which the more sophisticated missiles can use. An active defense against our own early ballistic missiles must not be excluded by definition. It is important instead to see what is feasible for the enemy and what they have to give up in order to construct such a defense. It appears on the basis of a preliminary investigation that an effective ballistic missile

defense may be both technically feasible and obtainable within Soviet defense budgets by 1962 or 1963.) Finally, some of the measures of civil defense, open to the Soviet Union, particularly evacuation, have very sizable effects on the simpler programs for improving U.S. posture.

On the other hand, it appears, on the basis of our work so far, that there are several alternative programs,* any one of which would be "adequate" in the sense that Russian counters would be infeasible in the given time period. However, there remain important uncertainties, particularly, in preserving top political and military control.

3. Inadequacy of Current U.S. Programs

In the preceding section we stated that our current program is inadequate. This is so in spite of the past considerable efforts of the Air Force to strengthen our ability to strike back in the face of a deliberate surprise attack. Many of our bombers will be on ground alert and some may be put on a continuing airborne alert. A high degree of dispersal and alertness is planned for our intercontinental ballistic missiles and, beginning in 1961, part of this force will be blast sheltered. However, plans for the protection of most of our retaliatory force (namely, the bombers and soft missiles) depend on our having reliable warning of an attack soon enough for a useful response. Yet, there is little basis in fact to suppose we shall get adequate warning with high confidence. In the early 1960's there will be several types of attack that could arrive at our bases without notice. ICBMs can be launched along trajectories that evade warning or drastically reduce it. Even a straightforward ICBM attack,

* Each a combination of many measures.

detected by our planned BMEWS radars, might yield too little warning if we make a realistic allowance for the time we would need for communication and to make the momentous decisions required. Moreover, the use by the Soviet Union of sea-launched missiles in a coordinated attack could effectively deny us any tactical warning whatsoever.

a. Results of a 1962 Attack

A limited warning attack employing only the number of missiles Intelligence now estimates the Soviet Union will have in the early 1960's could succeed in destroying most of our planned forces. For example, the force of ICBMs we now expect the Soviet Union to possess in 1962 might alone be enough to destroy over 97 per cent of our ground alert bombers and over 90 percent of our missiles.* Practically none of our overseas-based forces would survive a Soviet IRBM attack, and, in any case, some of the survivors would not be able to attack important targets in the Soviet Union.

Our efforts so far to protect our force have not been without effect. A larger effort must be allocated by the enemy to the destruction of our relatively small force of sheltered ICBMs than to our large number of soft manned bombers. In fact, the enemy probably would have to send more missiles against our less than 200 ICBMs than against almost 2000 manned aircraft in order to reduce the survival of each to the low level mentioned above.

*This particular outcome assumes that the Soviet Union bases a portion of its missile force on far north bases in order to gain the advantages of increased accuracy and payload possible with shorter range operation. This higher performance is especially useful to the enemy in attacking our hardened missile sites. However, even without forward basing, little of our force survives.

Our planned mobile forces, a few Polaris submarines and aircraft carriers at sea, and possibly some airborne alert bombers should not expect to escape unscathed. The carriers could easily be tracked and destroyed before they could launch aircraft against Soviet targets and the possible use by the enemy of anti-Polaris patrols has been mentioned above. This patrol technique might also be effective against airborne alert bombers. Moreover, these mobile systems suffer from serious communications weaknesses. An enemy attack which attempted to disrupt our communications and our control by attacking our command centers and our transmitting and relay stations, and which exploited radio blackout effects might prevent many of these mobile vehicles from being sent to target according to plan.

The ability of our vehicles which survive an attack to penetrate defenses and seriously damage the Soviet Union is doubtful. For example, neither a small surviving force of bombers nor the relatively naked Polaris missile would appear to have an easy prospect of penetrating well-designed Soviet active defenses. There is a good chance that the outcome for the Soviet Union would be a level of casualties well below the 20 million suffered by that country in World War II. And it might be possible, if the enemy adopts sensible active and civil defense programs, for him to limit casualties to well under 10 million people. The prospect of such a level of damage cannot be regarded as a high confidence deterrent under all circumstances likely to occur in the 1960's.

b. The Critical Problem of Control and Communications

In the above, we have emphasized particularly the problems of preserving the vehicles. It is worth focusing at some length on the still more difficult part of the system problem which has to do with maintaining

communications and control. We have stressed that the problems of preserving even the minimal functions of command and control for retaliation are among the most difficult we face in developing a deterrent, also among the least understood. Moreover, in limiting damage and concluding the war on satisfactory terms, hours or days after its opening, command and control play a crucial role and, once again, present the greatest problem of survival.

The key role of command and communications in retaliation can be made obvious by a consideration of the elementary necessities of retaliation. Central decisions and the transmission and receipt of positive signals are essential. If we make the mere non-receipt of a message a cue for starting World War III, we make accidental war much more likely. (This is one of the many reasons why we cannot separate the problems of calculated and miscalculated attacks.) The minimal functions that we want to preserve for the purpose of retaliation are, first, the gathering of information that we are under attack -- (we would like to keep this information coming until the inference is established with a high degree of confidence). Two, determining who the enemy is -- (as countries with an atomic capability multiply, this question will become more critical and more difficult to answer). Three, the transmission of this information to centers of decision -- (these centers of decision for the "ultimate response" must contain persons of high responsibility in the government. We have surrendered the power of Congress and might contemplate release from the control of the President, but must balk at an automatic response by the machinery itself or by some junior officer at the controls.) Four, we must preserve the existence

of the responsible decision makers and get them to the decision centers. Five, we must decide what response to make. Six, we must preserve the means of transmitting the decision on response to the commanders of the vehicles which will deliver this response. And seven, we must preserve the vehicles themselves, and launch them in such numbers and with such aids as make likely their destruction of targets.

It is evident from this description that political and military control and communications are crucial in even the minimal function of retaliation. Moreover, it is here that the system aspect is most evident. The job involves saving a system of vital elements and a network of communications between them, at least until we can decide to retaliate and coordinate the retaliation. For the function of limiting damage and terminating the war, the job is much harder. It involves preserving the elements and a net of communications for days and possibly weeks.

What are the problems? There are many. General Twining was very likely right in saying recently that "communication is the weakest link in our military capability." There is, first of all, the problem of preserving the transmitting as well as the receiving points and, in particular, keeping the centers of decision alive. It is difficult to multiply Presidents and Vice Presidents of the U.S. or top military commanders or to disperse them or keep them airborne or underwater. For example, at 73 flying hours per month, we would still require some ten substitutes for the President or for the Chairman of the Joint Chiefs or for the Commander of SAC, etc., to be sure that some were in the air at all times. Second, there is the problem of communication nets themselves. Most of the present landlines and radio communication systems

are very vulnerable to disruption by physical damage from enemy attacks. Antenna structures and overhead lines on telephone poles are weak; underground cable lines used in the present telephone system are brought above ground at intervals in soft facilities such as repeater points, central offices in large cities, and at river crossings. The vulnerability of our trans-Atlantic cables was headlined in February when five of them were cut, presumably by a Soviet fishing trawler. Our note at the end of March to the Soviet Foreign Ministry stated: "The locations and presence of the trans-Atlantic submarine cables that have been cut are widely known among world fishing and maritime circles. They are shown and marked on U.S. Admiralty and Navigation Maps, which are available to the general public." Soviet trawler captains are an interested part of the general public. A nest of other communication problems has been disclosed very recently in connection with Argus and the high altitude nuclear shots of last summer. The most serious of these is the problem of radio blackout. For surprise attacks in which political and military headquarters and SAC bases are hit with an initial wave of enemy ICBM's, only a very small percentage of the control rooms, landlines and radio equipment used for the control of our strategic forces would be expected to survive, and any surviving centers would be hindered from communicating by radio blackout. This would leave us without the ability to perform critical functions required for the successful prosecution of a war such as damage assessment after the attack, the promulgation of retaliatory strike orders, and the control of aircraft and ICBM's.

c. The Vulnerability of our Air Defenses

If we are to prevent enemy bombers from having a free ride over

the United States in the event of war, we must be able to preserve at least a modest active defense capability throughout the campaign. But, what if the enemy chooses to attack our defenses, tactics that often appear a useful aid to our own penetration of Soviet defenses? Our air defenses are much more centralized than those of the Soviet Union. The SAGE centers are soft, and hardened Super Combat Centers are not scheduled to come into operation until mid-1964. Moreover, we plan no back-up control of our weapons. Bomarc is completely dependent on SAGE and our interceptors almost as much so. At any point during the next five years, the expenditure by the enemy of a few ballistic missiles could practically wipe out our area defenses. Moreover, quite apart from the vulnerability of their control centers, and their communications, to direct attack, the defense weapons are both soft and relatively concentrated. Much of our defense against the air breathing threat can be destroyed before it has the opportunity to attack an enemy aircraft.

4. Some Actions to Improve our Posture

What can be done to improve this deterrent posture? First, we must view the problem as a system problem. It is not enough simply to arrange to have vehicles surviving, or communications, or penetration aids. All of the elements needed to assure the high confidence delivery of an adequate weight of attack must be present. These problems are urgent. It is necessary to take some actions that can have an early effect on our posture as well as others to improve our future position. We should not refrain from adopting programs now because we hope that something much better will be coming along soon. Moreover, in considering these actions, we should not be reluctant to adopt programs that might have

only a short useful life. The technology of weapons and world power relationships are changing too rapidly for us to be able to make firm long term plans.

a. Improving our early 1960's posture

The earliest measures that can be put into effect involve making changes in the method of operation of our forces in being. Two measures can be introduced at a relatively early date: an airborne alert program for our B-52 force and a dispersal program for our B-47's using existing airfields. Such a dispersal can be patterned on our "reflex" B-47 operations abroad. Other measures are needed: more dispersed and sheltered ICBM's than the number now planned; the Atlas program should at least be doubled in size, with single missile sites and extra hardness to at least 200 psi; some of our bombers should be sheltered in order to make our large ground alert bomber force a much more expensive target for the enemy (this program of protection gives us close to 400 sheltered bomber and missile points and about 50 soft); command and communication centers need to be multiplied and put deep underground; communication links need hardening and back-up. One modest program now being studied at RAND would add up to some two or two-and-one-half billion dollars to our defense budget annually if we were to make no compensating cuts elsewhere in our defense program. Such a program would increase by about ten times the number of Soviet ICBM's needed to leave us with only the small surviving force we would have if our currently programmed force were attacked by the now estimated Soviet force. What is more important, the annual costs of such a program would require an enormous increase in the Russian strategic

offense budget. It might be nearly ten times the estimated current budget for its medium and heavy bomber force. We think this infeasibly large in the given time period. Against the expected Soviet offense and defense, the proposed force would assure the delivery of a heavy retaliatory blow. Perhaps 80 per cent of our forces would be able to survive in this situation compared with perhaps 3 to 10 per cent or less of the ground alert force with the programmed force.

b. Strengthened research and development programs

In addition to making decisions with respect to deployment, operation and procurement intended to strengthen our strategic power, additional effort is required on research and development. Larger payload ICBM's than any now in development may have several important uses. The Atlas or Titan provide a useful basis for such developments. And mobile land and airborne systems would appear to warrant development. For example, work underway at RAND suggests that development of a long-endurance chemical aircraft as an air-launched missile carrier should be started.*

*Because of the novelty of this long-endurance aircraft, a short explanation may be called for. Basically, none of our bombers in the force or undergoing development as weapons systems have been designed for the long endurance which is the key to the air alert mission. They have been designed to penetrate defenses rather than to evade the enemy offense by staying airborne. For this reason, they go as fast as is compatible with other performance requirements such as range. However, for a long-endurance mission, within limits, the slower one covers a given distance the better, since it means staying up in the air longer. The aircraft under study have been designed not as bombers that penetrate but simply as airborne missile-carrying and launching platforms.

Most of the aircraft under study, all of which use presently available technology, range in gross weight from 300,000 to 500,000 pounds, have a payload of 25,000 to 100,000 pounds (Note: this range of payloads might be made up of 2 to 8 ballistic missiles of 1200-mile range carrying a 600-pound payload.) and an unrefueled endurance of 40 to over 150 hours. This long endurance would be made possible by the use of low-drag boundary layer control on the wing and empennage surfaces. (Cont.)

Preliminary investigation suggests that these systems might have a large margin of superiority over the nuclear-powered CAMAL.

c. Protected control and communications

The importance of control and communications is being given increased recognition. By 1964, with the advent of SACCS and SAGE Super CC's, the annual budget for leased landline facilities, alone, will probably exceed \$200 million per year. However, to protect adequately our command and control communications in the mid-1960's, this communications budget will need to be increased by perhaps as much as two or three times the anticipated rate for the programmed system. And much harder control centers than any now planned will be needed for our decision-makers -- both for the Joint Chiefs of Staff and for our top political leadership. Hard or mobile control centers will be needed at a cost of about \$0.5 billion over a five-year period. The remainder of the money could be spent in a number of different possible ways to obtain the required protection for the communications circuits. One choice would be to construct a network of hard cables in the U.S. and employ UHF communications equipment carried in ICBM's and satellites, along with hardened antennas at fixed ground points, for augmentation of programmed communications to the positive control line and to overseas points. Wise expenditure of additional funds for communications, amounting to one or two billion dollars over a five-year period could increase communication survival dramatically and might make it very difficult for the enemy to

Other missions besides the carrying of missiles are possible with this type of aircraft. For example, it might be used for airborne early warning or as a platform for infrared-detection equipment to detect ballistic missiles in the launch phase. Finally, the aircraft would be well suited for the job of keeping communications and control centers aloft, and relatively free from attack.

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interfere with the wartime control of our strategic forces.

The use of communication satellites and of transmitters in sounding rockets and in ICBM's are some of the applications of rocketry and space technology which appear to be of importance for the mid-60's. So also are satellites for reconnaissance and for infrared strike alarm systems.

d. Intelligence and reconnaissance

Better intelligence on current Soviet forces and R&D test programs would allow us to plan both the composition and use of our own forces more effectively. Better intelligence projections, more accurate if possible but, above all, more descriptive of the real uncertainties we must face in planning future U.S. forces, are essential. The counterforce mission, of course, places particularly severe requirements for intelligence on the location of Soviet strategic forces, both missiles and bombers. A substantial effort at both the collection and analysis level will be required to meet these requirements. (Particularly in the shorter run between now and 1962, energetic steps are required. There are a wide variety of collection efforts that need to be pushed.)

Although this whole area is too technical and sensitive to consider here in detail, we can cite a few suggestive illustrations. For example, a much-improved reconnaissance capability is needed for our general intelligence objectives; it is crucial if we are to plan a comprehensive counterforce mission. Toward this end we feel that the Sentry program would benefit from more development work in some neglected areas, among them the problems of operating under conditions of darkness and low light, as in the Arctic winter. Moreover, work needs to be done on all-weather satellite reconnaissance, and cloud reconnaissance needs

to be taken from the research stage to a system useful in USAF operations.

The opportunity to learn about Soviet missile sites may well be a fleeting one; we must observe some sites under construction to enable confident identification of others which precede or follow. Once built, such sites may become undetectable.* Our programs must therefore examine the advisability of trading performance for time. And toward this same end the Air Force should keep improved versions of balloon and aircraft system plans and prototypes up to date, ready to produce and use should the situation permit.

Above all, our attitude toward reconnaissance should not be defeatist because some of the problems look so difficult, should the Soviets do everything in just the right way to confute us; instead, the importance of this job makes it advisable to risk substantial effort, especially in research and development, in order to take quick advantage of any opportunities that may present themselves.

e. Improving our air defenses

The primary mission of our air defenses is to help protect SAC, principally by providing it usable warning. With the advent of ballistic missiles this has become an increasingly difficult task. However, while the prospect of high confidence warning of all forms of ballistic missile attack is remote, the job of providing usable warning against manned bomber attack remains feasible and important since the threat of manned bomber attack remains great in the ballistic missile era, especially against hard sites. Doing this means, above all, plugging the remaining holes in our radar periphery.

*The Air Force should be carrying out a systematic program of viewing our own ballistic missile sites while under construction by a variety of techniques as an aid to our reconnaissance programs.

In addition, if we are to be able to fight a war and limit damage to the United States, our air defenses must themselves be protected from attack. This means, for example, sheltering our Bomarc units in addition to their means of control, the SAGE centers, and the communications which serve them. Without well-protected control centers, most of our area defenses could be knocked out by a few enemy ballistic missiles. The importance of protecting defenses has been recognized in the plans of the Air Force for Super Combat Centers. But as we pointed out above, these will not come into operation until the mid-1960's. This program should be pushed as rapidly as possible. And these Centers must be deep underground if they are to survive likely mid-1960 attacks and it is feasible to do so at relatively low cost. Otherwise they will still remain a profitable target. And without Bomarc shelters, the assignment by the enemy of about 50 ICBM's would be enough to destroy 80 per cent of this system. At about 5 per cent of the cost of the Bomarc system, it could be sheltered to 150 psi and dispersed on four times as many points as presently programmed. With such measures our air defenses can be made a difficult and expensive target system to destroy.

The measures discussed here will help greatly to deter surprise attack, limit damage if war occurs, and help to end a conflict favorably. This combination of capabilities might make the difference between having a surviving nation able to recover and having close to nothing left in the way of an organized society. Moreover, these studies suggest strongly that, at least in the early 1960's, counterforce attacks are useful even if we know little of the location of Soviet missiles and are mostly able

to attack Soviet bomber bases. Of course, if we are able to attack Soviet missile sites, and this possibility is by no means to be ruled out, then our damage might be limited even further.

5. The Size of the Strategic Effort

The programs we have sketched, just for the minimal critically necessary objective of deterring general war, involve spending at least 2.5 billion dollars more a year for four or five years. How much of this can be obtained by shifts of resources within current budgets for the strategic force? It would be possible to obtain some of the necessary funds over the period of the program by shifts from uses which are very much less productive. For example, we would suggest a much more rapid phasing out of the B-47 than is currently planned, bringing the force down to some ten wings by 1963. This would release a total of about 2 billion dollars during the period of the program and also scarce resources such as flight crews who might otherwise be bottlenecks in getting an air alert for the b-52's. (Even if the B-47 is cut to one-third its current level, we believe it should be dispersed to about three times as many bases.) It appears to us that a cut in the plans for construction of super-carriers could finance much of the increase in the Polaris program. The larger size and extra expense of super-carriers is usually charged to their general war function, and we find this function very dubious. This is not intended to be a complete enumeration of possible reallocations. (The joint Air Staff - RAND study of strategic offense forces should issue in recommendations for a good many others.) And it should be pointed out that while some of the increases we suggest can be financed over a four-year period, it is more difficult to match increases with decreases

on a year by year basis.

In any case, some perspective appears to be called for in connection with the financing of a program of such key importance as the protection of our deterrent force. Efficiency, of course, needs consideration and surely some parts of the U.S. military establishment could be cut with little or no loss. There is no question whatsoever in our mind that some of it could be cut with small loss compared with what we would gain from the new uses we have outlined for the resources. However, we do not believe that inefficiencies that have persisted throughout two administrations in the post-war years can be rooted out entirely and it makes little sense to condition the execution of the most vital program of national security on their elimination.

To the extent that these vital programs are financed by reallocation, they call for cuts elsewhere and face slow going against the opposition of those affected by the cuts. To the extent that they are financed by new money, they are likely to be opposed by those who advocate holding the budget constant. Given the extreme urgency of requirements for even the minimum function of deterrence, we think it unrealistic to let the attaining of this capability wait on achievement of standards of efficiency so far unprecedented in so vast and unwieldy an institution as the U.S. military establishment.

In any case, we know of no evidence that all of the major objectives of U.S. military posture in connection with general war can be obtained within the amounts currently expended. On the contrary, it appears to us that these amounts will need to be increased, and we find no justification whatsoever for the frequent suggestion that they can easily be cut for the

purposes of spending more on limited wars. However, we do not wish this argument to be taken as meaning that the additional resources for general war should be found at the expense of our limited war capabilities.

II. OBJECTIVES FOR LIMITED WAR

So far we have been discussing the problem of deterring or fighting a general war -- that is, an all-out thermonuclear war involving the two central powers. This is undoubtedly the major military problem we face. But there are other vitally important ones. We have an obligation to defend our allies and to help them defend themselves, and a vital interest in the protection of neutrals. We would like to defend these third areas by means that (1) are stable in that they do not unnecessarily risk general war, (2) are consistent with the political objectives defended, and (3) offer a relative advantage to the West. Finally, this must be done within budgets that are feasible and acceptable to the United States and its allies. We have made clear that an improved limited war capability should not be obtained at the expense of our capabilities to deter and fight general war. We do not think we can safely cut our expenditures for the strategic forces.

The United States cannot, on the other hand, meet its needs to deter and fight limited aggression simply as a by-product of its capability to deter and fight general wars. In fact, we believe that both the United States and its allies must expand their efforts for this purpose.

A. INADEQUACIES OF WESTERN POLICY

The U.S. defense of third areas in the post-war world was, frequently implicitly and sometimes explicitly, based on our power to wage a nuclear central war. So, Mr. Truman's ultimatum to the Russians forcing their withdrawal in Iran. There is no question that the threat was realistic. Our power was one-sided. We had a monopoly of nuclear weapons and we could have emerged from such a conflict with relatively little damage. Moreover,

the resulting central war would have been limited in violence because of our own predominance.

It is significant that even in the period of our nuclear monopoly we did not invariably use this threat, even though there was a considerable portion of the full scale of aggressions against which it might have appeared useful. The threat to bomb our major antagonist was simply inappropriate for some of the aggressions that took place, partly because our antagonist appeared only indirectly in these aggressions, that is by proxy. And the direct use of nuclear weapons against smaller aggressors often seemed out of proportion, simply inappropriate. Some cumulatively important incursions seemed well below the threshold justifying nuclear response when judged piece by piece as they presented themselves. In some cases, the use of nuclear weapons raised problems with our allies and with public opinion in the United States as well as in allied and other countries. Sometimes, there was a question about the direct damage it might do to the country defended. But all of this applied to a period in which there was no question that the military advantage lay with us. We had the bomb, and a highly developed delivery capability. Our enemy did not.

The end of the nuclear monopoly meant that the military risks to ourselves in threatening to use our weapons of nuclear general war increased. As we have stressed, we know of no way to assure that a powerful and resourceful enemy like the Soviet Union, exploiting the asymmetrical advantages he has in his secrecy will not be able to inflict damage on us measured in tens of millions of dead even if we strike first. Moreover, this expectation has, with varying degrees of precision, become the

general one. Accordingly, there has been a search for means of response at the periphery which risked less, and yet are adequate. The notion of limited nuclear war employing tactical nuclear weapons rather than strategic weapons has received prominence as a policy for defending third areas. Discussions of limited war and graduated deterrence have emphasized the nuclear end of the graduated scale because it was felt that tactical nuclear weapons favored the defense and, in particular, that the U.S. had a large superiority in its stockpile and technology of tactical nuclear weapons, and an inferiority in manpower and non-nuclear armaments.

However, it should be apparent that the technological superiority in tactical nuclears is a transient phenomenon and the relative stockpiles available will be a matter of Soviet as well as U.S. choice. Bilateral limited nuclear wars, then, raise many questions. Can they be stabilized at a less than all-out level of nuclear violence? Is a nuclear response invariably appropriate to the variety of limited aggressions we may face? Will the use of tactical nuclear weapons offer a relative advantage to the United States?

Our plans for the defense of third areas are based primarily on the fighting of nuclear wars with U.S. forces. Our emphasis on a nuclear defense of third areas has led to a sharp reduction in the conventional warfare capabilities of both the United States and the allies. And not only have non-nuclear forces-in-being been cut back, but we also plan to reduce these forces further, and to reduce plans for procurement of modern non-nuclear equipment. We have already cut down on research and development on non-nuclear armaments. Each of the other services has elected to compete in the field of strategic warfare. And while competition has its useful aspects, it hardly seems sensible for the Army, for example, to

concentrate so much of its effort on creating nuclear forces of a quasi-strategic character. Moreover, the Air Force has emphasized nuclear capabilities in its planning and in its research program so exclusively that it appears that, in time, it will have nearly surrendered all non-nuclear combat missions.* Abroad, our allies have emulated us by reducing their own defense budgets on the grounds that conventional arms are expensive and not needed since their defense is provided by America's atomic bombs. In short, we and our allies seem to be in the process of foreclosing the option of being able to fight non-nuclear wars.

B. SOME ALTERNATIVES

Should the United States depend on an all-out nuclear capability and the simple threat of its use to deter all limited aggressions? We think the answer to this is "No". This does not mean either that the possibility of general war can be ruled out or that there are no circumstances under which the United States would want to initiate general war. Nonetheless a threat by the U.S. to initiate a general war, viewed realistically, has shrunk until it can apply only to the most extreme provocations.

Should the United States rely exclusively on a broader nuclear capability -- namely, one including the capability of fighting limited aggressions? The answer here appears to us again to be "No". This would not prevent the West from losing piecemeal to aggressions below the threshold at which it would be appropriate to use nuclears at all (or in which it would be advantageous to the West to have established nuclears

*With the cancellation of the F-109, it appears that the Air Force is budgeting a total of 21 million dollars for tactical air research and development in FY 60-63 out of a total R&D budget of close to twelve billion dollars. Even with this F-109 money, the total comes to about one-quarter of a billion dollars.

as part of the ground rules). We do think there are better alternatives open to the West.

First, there are some aggressions in which nuclears would increase the comparative military advantage of the aggressor if he uses them in his opening attack: nuclears increase the effectiveness of a surprise attack and the speed in which the war can be gotten over and therefore confer greater importance on tactical forces in being, which is where the dictatorships have so far had a superiority, and it gives less value to war mobilization potential which is where the democracies have a definite advantage. (It is generally assumed that the best way for the West to fight a limited war is the way that promises to end it quickest. This dogma should be questioned. As we point out in the next section, the greater economic resources of the West offer many advantages in a war of attrition. Moreover, though it is generally assumed that getting the war over quickly reduces the chance of its spread, this is by no means clear. Nuclear limited war, simply because of the extreme swiftness and unpredictability of its moves, the necessity of delegating authority to local commanders, and the possibility of sharp and sudden desperate reversals of fortune, would put the greatest strain on the deterrent to all-out thermonuclear war.)

Limited nuclear wars, as we have indicated, have not yet been shown to be stable. This applies even to nuclear wars that start at a rather low level of violence. At the present time, some attention is being given to the possibility of fighting limited wars much closer to the brink than even the rather violent (half-megaton weapon) nuclear wars considered for restricted geographical areas by Henry Kissinger and others.

We refer to the so-called "limited central" wars involving direct conflict between the strategic forces of the two central powers -- the United States and the Soviet Union -- the sinking of submarines, the downing of planes and even, at the extreme, nuclear bombing of selected cities. The ability to threaten such conflicts in defense of third areas is beginning to receive and is worth intensive study. However, this type of conflict presupposes a very high degree of stability of the deterrent to general nuclear war. It is questionable whether such a degree of stability is feasible at all, or if it is feasible, whether it could be obtained as cheaply or as soon as an increased conventional capability for defending third areas. We know of no way at present of keeping such a war distinct from the sort of general war treated in Part I.

A stronger conventional capability, in spite of statements to the contrary, is entirely feasible for the Western powers. It is certain that we will want it for some eventualities. We may want it for all or nearly all. Many actions need to be taken in order to get a better capability, but one fundamental is an expansion of our research and development in this area.

Could we safely develop an improved conventional capability and a capability for all-out nuclear war and nothing in between? The answer to this also is "No". First, though we might never initiate a limited nuclear war, may never find it to our advantage to do so, we need to develop a less than all-out nuclear capability. If we don't, the enemy might use tactical nuclear weapons and we would have no choice but either to go all out or to accept defeat. We cannot claim to understand how a limited nuclear war should be fought nor exactly what capabilities should be developed for this kind of war. We believe that much more research needs to be done before a sensible policy for this type of war can be developed. Second, it is

conceivable, although not yet clear, that there are cases in which the use of tactical or strategic nuclear weapons in a limited war as a defense of third areas would be stable, politically appropriate and offer us a large relative advantage. For both these reasons, we must prepare a less than all-out nuclear defense for third areas. In short, we need all three: an improved conventional capability, and the ability to fight both all-out and limited nuclear conflicts.

The principal point to be made, however, is that, to reverse the atrophy of our conventional forces, we need a renewed stress on our capabilities to meet limited aggressions with less than nuclear means. We have to face up to the implications of our loss of the nuclear monopoly for peripheral aggressions. Arguments for the use of nuclear weapons in limited war by us have sloughed off the questions of political appropriateness, have too hastily assumed that the nuclear weapons gave us rather than the aggressor relative advantage, have ignored the stability problem and have assumed the infeasibility of a conventional response. It should be observed that neglect of the questions of political appropriateness is characteristic of pre-crisis discussions of limited war policy. In the actual succession of crises in the last years, it has always been a paramount issue. We might just as well face up to it in our preparation of policy in advance of crises. It is obvious that the other services have important roles in limited wars. Does the Air Force? It is sometimes assumed that the job of providing forces for limited war can be left to the Army and Navy (including the Marines) and that no major Air Force contributions will be required. This assumption is not borne out by RAND studies. We have recently completed a study of a limited war in Iran

in which land-based air forces were the only American forces able to intervene soon enough, and in sufficient strength, to prevent the collapse of the regime. We believe that this is not the only instance in which such a situation could arise.

The RAND program of limited war research is not yet sufficiently advanced for us to make specific recommendations for an Air Force posture for limited war. What we can say at this stage is that:

1. In the strategic situations we envision, the United States will be less and less able to prevent Soviet aggression by threatening general war and we should be prepared for actions by the Soviet Union and other countries which may lead to limited wars of increasing frequency and seriousness. This does not mean that the threat of general war will be absent, but rather that its utility as a deliberate instrument of U.S. policy will be shrinking;

2. Land-based air forces may be called upon to provide a major and essential contribution to limited wars;

3. In many limited wars the use of non-atomic munitions may be militarily as well as politically to the advantage of the United States;

4. A limited war, especially one of high intensity, increases the danger of general war. This situation could put a serious strain on our strategic deterrent force, and therefore strengthens our reasons for improving our deterrent force..

5. If our belief is correct, that greater stress should be placed on non-nuclear limited capability, a large share of the defense, in the NATO area, in particular, will have to be borne by our allies -- especially in the contribution of manpower. Our allies have emulated our reduction of

conventional forces by reducing their own defense budgets. In the future, it appears likely that both they, as well as we, will have to spend more on defense.

III. BUDGETS

We believe that the country needs urgently to do more to deter general war, to improve our ability to fight and conclude such a war and to increase our limited war capability. These actions call for an increased defense budget. On the other hand, much of the current controversy on defense policies stems from the belief that increases in defense are not feasible or, if feasible, are not acceptable to the American people. One view is that we should spend less on deterrence, more on counterforce or active or passive defense of cities, and take up the slack in expenditures on limited war forces; or in a less extreme version: less for deterrence, less for counterforce now (eventually more) and spend the difference on limited war forces. The opposing views generally call for more money on deterrence and counterforce and less on limited war. All of these positions are influenced by the belief that defense budgets cannot be increased.

The belief that increased budgets are economically infeasible or could have drastic consequences for our way of life is not supported by any serious economic analysis. We shall present some evidence on the subject. In fact, the sacrifices entailed by budgets some ten or twenty billion dollars a year higher than current budgets would be quite modest. Nonetheless one might ask whether the American people are willing to make even modest sacrifices. It is apparent that this will depend on the public understanding of the risks. In fact, the usual argument for the importance of holding the budget constant is itself a roundabout way of expressing a judgment that the risks are not large. In our opinion they are very great and it is important that the risks be more widely understood. For this reason, we should avoid depreciating the dangers either of general war or of limited war.

Analogous considerations apply to the level of effort of our allies. If we are devoting half as much of our gross national product to defense as is the Soviet Union, it is also true that most of our allies are devoting about half as much as we. We must bear some responsibility for this because we have not ourselves made clear that, with the end of the monopoly of nuclear weapons in the West, greater effort is called for. In what follows we discuss U.S., NATO, and Soviet Union budgets.

A. THE U.S. DEFENSE BUDGET

The nation cannot go bankrupt in the conventional sense of the term from a high rate of defense spending. The threat is one of mounting inflationary pressure, not of inability to take care of interest obligations or to pay off debt as it matures. What people must fear, therefore, when they speak of "bankruptcy" of the government, are certain sacrifices entailed by increasing government outlays, but not bankruptcy in the literal sense.

These sacrifices are (1) giving up other goods in order to devote more resources to defense, (2) aggravating the risk of inflation if taxes cannot be (or are not) raised sufficiently, and (3) impairing incentives to produce because taxes are increased and/or consumption is reduced.

Let us examine each of these sacrifices.*

*An excellent discussion of these points is contained in The Problem of National Security, A Statement on National Policy by the Research and Policy Committee of the Committee for Economic Development, July, 1958.

The United States is enjoying the highest standard of living in the history of civilization. To say that we cannot at this point give up any non-defense goods is almost absurd. To be sure, the more we give up, the greater the "sacrifice." But the defense budget is currently about 10 per cent of the gross national product (GNP). In 1944 defense outlays were over 40 per cent of gross national product, and in 1953 they amounted to 15 per cent -- in years when total GNP was considerably smaller than it is now. To increase the defense budget by as much as 50 per cent would not cut back consumption or investment very sharply; indeed, it would leave more for these purposes than was available as recently as 1953 -- which was not exactly a year of heroic privation.

Furthermore, the United States is capable of growing at a rate of at least 3 per cent, close to \$15 billion, per year. We could, therefore, increase the defense budget by over \$10 billion annually without retreating one iota from our present levels of consumption, investment, and non-defense items in general. We would only sacrifice part of the extra non-defense items that would otherwise become available after the budget increase.

The sacrifice would actually be smaller than the amount of the budget, because an increased defense budget would result in part in a reduction of unemployment and a greater national product than would otherwise be forthcoming. Between 4 and 5 million laborers have been unemployed during the past year or two. An increase in the defense budget (like any other increase in aggregate spending) would pull some of these unemployed

resources into productive jobs.* During the Korean War, the \$20 billion increment to the defense budget resulted mostly in "taking up the slack" and expanding the total national product -- not in sacrifices of goods that would otherwise have been produced.

Would inflationary pressures be unmanageable if non-defense goods are consciously given up by means of a tax increase? In this circumstance, there is no real problem of inflation.** Consider a \$10 billion increase in the defense budget. If the increase took place gradually over a three-year period, scarcely any problem with inflation due to the extra defense outlays would arise. In three or four years, growth of the economy would bring in extra revenues amounting to \$10 billion annually. If the budget were increased abruptly, extra tax receipts would be necessary for three or four years in order to avoid inflationary pressures. Growth of the economy in the first year would bring, with the present tax structure, an extra \$2 or \$3 billion in revenues, and the remainder could be financed by moderate (and temporary) increases in tax rates.***

*This is not to say that an increase in defense outlays is the only way to reduce unemployment. Other measures could certainly do so. Nonetheless, there is usually some slack in the economy, and a budget increase is not wholly a diversion of resources from non-defense goods.

**To avoid any inflationary pressure might require tax receipts somewhat in excess of expenditures, because even a larger balanced budget can generate some expansion of aggregate spending.

***The modest impacts of a 10 or 15 billion dollar increase in the national security budget are indicated in the study by Gerhard Colm, Can We Afford Additional Programs for National Security? National Planning Association, Washington, D. C., October, 1953, and in the subsequent paper by Gerhard Colm and Manuel Helzner, "General Economic Feasibility of National Security Programs," March, 1957, published in Federal Expenditure Policy For Economic Growth and Stability, Hearings before the Subcommittee on Fiscal Policy of the Joint Economic Committee, 85th Congress, 1st Session, U.S. Government Printing Office, Washington, D. C., 1958, pp. 356-364.

If taxes were not raised at all, and if the increase in the budget occurred gradually, there would be no problem of inflationary pressures. If the budget were increased abruptly by \$10 billion per year, there would certainly be some inflationary pressure for three or four years if tax rates were not raised at all. Past experience suggests, however, that it would be an inflation of the sort that occurred during the Korean War. This degree of inflation has some ill effects, mainly inequitable impacts on the distribution of income, but they are comparatively mild.

For increases in the budget larger than, say, \$10 billion a year, questions about controls are less easily answered. According to the principal study of this question that has been made, an increase of about \$20 billion per annum could probably be implemented without serious inflationary pressures by raising tax rates to their 1952 level.*

Would higher tax rates seriously impair incentives? For drastic increases in tax rates, we cannot answer this question. For the moderate increases mentioned above, past experience and the experience of other countries indicate that incentives would not be greatly impaired. Higher taxes do not necessarily undermine incentives to work or to invest.** Despite higher tax rates, incentives in the U.S. economy appeared to be as sharp during the Korean War as they are today -- and appear to be as sharp today as they were in the 1920's or the 1930's. Within the range of tax increases under consideration, the risk of damaging incentives and impairing future growth seems to be slight.

*Ibid.

**A higher average rate of tax along with lower rates on incremental income (e.g., rates for the middle and upper brackets) might actually increase the amount of effort that taxpayers wish to exert.

B. NATO DEFENSE BUDGETS

If the United States is able to spend more on defense, what about our Allies? The principal argument for defending Europe by the threat of nuclear war is our supposed inferiority in manpower and resources for conventional warfare. To what extent is this view justified? The NATO countries are both more populous and wealthier than the Warsaw Pact countries. In fact, when allowance is made for the unreliability of Russia's European Allies, it appears that NATO has a large advantage in resources for non-nuclear war with the Warsaw Pact countries.

However, while NATO has the resources, they are not being adequately employed in its defense. While the United States is spending about 10 per cent of its GNP on defense and the Soviet Union is spending perhaps twice as much, most of our Allies are spending much less. Many of our Allies, including West Germany, have been spending less than 4 per cent of their GNP on their defense. Only the United Kingdom, at 9 per cent, has come close to matching our effort.

This unwillingness of our Allies to make sacrifices for their defense stems in large part from the belief, which we encourage, that the defense of Europe is provided by the threat of general thermonuclear war and that the balance of terror will prevent such a war from occurring. As a result, there is little incentive on the part of the Europeans to defend themselves. The reasons we have used to justify our own reduction in non-nuclear arms has persuaded our Allies to emulate us and this in turn throws a still greater burden on our nuclear deterrent capability.

The argument presented above on the feasibility of larger U.S. defense budgets applies to the Western European as well. While these

countries are not as wealthy as the United States they are much more so than the Communist countries across the iron curtain which seem able to devote three or more times as much of their GNP to defense. Quite apart from the question of what allocation of the defense burden within the alliance is equitable, we would simply like to observe that an adequate defense of Europe in the 1960's very probably will call for increased rates of expenditure; somehow this effort will have to be made. There is much that the United States can do. But European countries directly in the line of Soviet advance can and will have to do more. In fact, unless the European NATO powers do increase their defense budget substantially in the 1960's, their ability to resist Communist aggression is doubtful.

C. SOVIET UNION DEFENSE BUDGETS

If we increase our defense budgets, can the U.S.S.R. offset our actions merely by increasing the scale of its defense effort? The answer may depend upon when we take action. Let us consider the Soviet situation.

The Soviet standard of living is still relatively low. At the present time, it would be painful indeed for the U.S.S.R. to give up additional consumption goods, and it would jeopardize future growth significantly should the Soviet sacrifice investment goods. In the middle 1950's, their budget was in the neighborhood of 15 or perhaps 20 per cent of GNP. At the same time, it must be emphasized that total Soviet GNP was no more than 1/3 as large as ours (while its population was about 1/6 larger than ours). Soviet GNP is still about half of ours. Clearly an increase of \$10 billion per year in the Soviet defense budget would disrupt its investment program or deny consumers relatively important parts of their

standard of living -- because the U.S.S.R. is comparatively poor at present.

A decade hence, however, this situation may be a great deal different. The U.S.S.R. is growing rapidly. GNP may increase 5 or 6 per cent per year, reaching an equivalent of from 320 to 480 billion (1955) dollars by 1975. If 15 per cent was devoted to defense, the U.S.S.R. defense budget could rise to an equivalent of 60 to 115 billion dollars by 1975 -- at least 2 to 4 times its present level. And by 1975, and perhaps much earlier, Chinese Communist levels of output and of defense expenditure may have become of primary importance in the defense balance.

Increments in the U.S. defense budget now would be exceedingly difficult for the U.S.S.R. to match, and the upward pressure on the Soviet defense budget would disrupt this impressive growth. A decade or so hence, however, it may not be difficult for them to match our budget increases, and their growth may already be an established fact.

The Soviet's willingness to use turnover taxes and/or inflation as the means of financing programs means that higher tax rates would probably not impair incentives to work. Since the government directs the investment program, incentives to invest would not be affected.

However, rolling back consumption or denying increments to consumption (given the relatively low standard of living at present and the limitations on freedom of individuals) might aggravate the Soviet problem of providing incentives. Indeed a great deal of social unrest and disorder might be generated if the Soviet attempted a large expansion of its defense activities. Since this effect on incentives is tied to the sacrifice of non-defense items rather than to tax rates, the magnitude of this effect too may diminish greatly in a decade or so.

The exposition of the levels of defense budget of the major powers and of the sacrifices they imply has direct relevance for Air Force decisions. We emphasized in Part I that the principal objective of our defense choices is to force the enemy to great and, if possible, infeasible expenditures. This is how we test the effectiveness of a change in U.S. programs. Moreover, there are measures that give us leverage, measures that force on the enemy an offsetting expenditure very much greater than the cost of the measure to ourselves.

The view is frequently expressed that the grand Communist plan is to force the West to bankrupt itself through higher and higher defense budgets. This view has no basis in fact or in Communist doctrine. The discussion of this section is intended to show that it is not the United States and its Allies that are most constrained by their resources; large increases in Soviet defense budgets are clearly very much more painful than increases in Western defense budgets.

However, by the late 1960's and 1970's the relative situation of the contending powers probably will have changed significantly. Without a settlement of many of the outstanding international differences we will be faced with high and growing defense budgets. But now and for some time to come, it is we and not the enemy that has the advantage in resources. We need to exploit these resources and, in fact, use them as a weapon in the conflict.

D. CONCLUSIONS

The gist of our analysis has been on the need for expanding the national effort to deter or fight both general and limited wars, and on the feasibility of such expansion. This does not, of course, mean that

all defense programs need expansion; still less that they need expansion proportionately. In fact we have suggested a few cuts that are indicated and believe that there are others. The augmentation called for is not a simple multiplication of offense and defense vehicles: it aims to strengthen the ability of these vehicles to survive in a general war, and, in particular, to function as part of a national system with at least a minimum of controlled connection. It is designed to help get over the many barriers a resourceful enemy can interpose to our deliberate retaliation and prosecution of the war to its end.

The additions enumerated for the goal of deterring general war, together with the suggestions (quite a bit less complete) for preparing to prosecute a general war, come to less than three billion dollars a year. Some offsets are practicable. These numbers are tentative and we have no quantitative estimates at all of the expansion needed for limited war. It will be apparent, however, that if the risks of both general and limited war are serious, a much more substantial national effort can be made for both. We believe that the dangers of not making the mild national sacrifice involved are very grave.